

SONY INTERNATIONAL (EUROPE) GMBH
PAE04-016WSL
P30524EP

5

Claims

1. A short-range wireless mobile communication system with a first terminal (1) and a mobile terminal (2) that are each adapted for transmitting and receiving an information carrying signal wave, whereby at least the first terminal (1) or the mobile terminal (2) comprise a directional signal wave converter (1a) for transmitting and/or receiving the information carrying signal wave with a directional characteristic (1b_I, 1b_{II}, #0, #0'), and a control means (4, 5, 13, 20) that is adapted for controlling the directional characteristic (1b_I, 1b_{II}, #0, #0') according to a position of the mobile terminal (2) relative to the first terminal (1).

15

2. A short-range wireless mobile communication system with a first terminal (1) and a mobile terminal (2) that are each adapted for transmitting and receiving an information carrying signal wave, whereby at least the first terminal (1) or the mobile terminal (2) comprise a directional signal wave converter (1a) for transmitting and/or receiving the information carrying signal wave with a directional characteristic (1b_I, 1b_{II}, #0, #0'), and a control means (4, 5, 13, 20) that is adapted to control the Half Power Beam Width (#0, #0') of the directional characteristic (1b_I, 1b_{II}) in response to the actual distance between the first terminal (1) and the mobile terminal (2).

25

3. A short-range wireless mobile communication system according to claim 2, characterized in that the control means (4, 5, 13, 20) increases the Half Power Beam Width (#0, #0') of the directional characteristic (1b_I, 1b_{II}) from a first value (#0) to a second value (#0') upon the distance between the first terminal (1) and the mobile terminal (2) falling short of a predefined distance value.

4. A short-range wireless mobile communication system according to claim 3, characterized in

35 that the Half Power Beam Width of a second value (#0') conforms to the range of directions allowed between the first terminal (1) and the mobile terminal (2).

5. A short-range wireless mobile communication system according to claim 4, characterized in

that the directional characteristic (1b_I, 1b_{II}) with a Half Power Beam Width of a second value (#0') is of an omnidirectional characteristic.

6. A short-range wireless mobile communication system according to one of the
5 claims 2 to 5,
characterized by
a distance determination means (20) for determining the distance between the first terminal (1) and the mobile terminal (2).
- 10 7. A short-range wireless mobile communication system according to claim 6,
characterized in
that the distance determination means (20) comprises an ultrasonic distance measurement system.
- 15 8. A short-range wireless mobile communication system according to claim 6 or 7,
characterized in
that the distance determination means (20) comprises an optical distance measurement system.
- 20 9. A short-range wireless mobile communication system according to claim 6, 7 or 8,
characterized in
that the distance determination means (20) is adapted to determine the distance between the first terminal (1) and the mobile terminal (2) based on a Received Signal Strength Indicator (RSSI) value.
25
10. A short-range wireless mobile communication system according to one of the
claims 6 to 9,
characterized in
that the distance determination means (20) is located on the first terminal (1).
30
11. A short-range wireless mobile communication system with a first terminal (1) and a mobile terminal (2), whereby the first terminal (1) and the mobile terminal (2) each comprise a transceiving means (7, 8) for sending and receiving an information carrying signal wave with the transceiving means (7, 8) of at least the
35 first terminal (1) or the mobile terminal (2) further comprising a controllable directional signal wave converter (1a) for transmitting and/or receiving the information carrying signal wave with a directional characteristic (1b_I, 1b_{II}, #0, #0'), and the short-range wireless communication system further comprising a control means (4, 5, 13, 20) with a movement monitoring means (13) for

monitoring a movement of the mobile terminal (2) relative to the first terminal (1) and a direction adjustment means (4) for adjusting the directional characteristic of the controllable directional signal wave converter (1a) according to the movement of the mobile terminal (2) relative to the first terminal (1) as monitored by the movement monitoring means (13).

- 5 12. A short-range wireless mobile communication system according to claim 11,
characterized in
that the movement monitoring means (13) is located on the mobile terminal (2)
10 and/or on the first terminal (1).
- 15 13. A short-range wireless mobile communication system according to claim 11 or 12,
characterized in
that the movement monitoring means (13) comprises a sensor means (11-1, 11-2,
12-1, 12-2) for providing one or more electrical signals corresponding to one or
more physical quantities related to the movement of the mobile terminal (2)
relative to the first terminal (1).
- 20 14. A short-range wireless mobile communication system according to claim 13,
characterized in
that the sensor means (11-1, 11-2, 12-1, 12-2) comprises an acceleration
sensor (11-1, 11-2) for providing an electrical signal indicating an acceleration
value associated with the movement of the terminal housing the sensor means.
- 25 15. A short-range wireless mobile communication system according to claim 13 or 14,
characterized in
that the sensor means (11-1, 11-2, 12-1, 12-2) comprises a gyroscope sensor (12-1,
12-2) for providing an electrical signal indicating an orientation value associated
with the movement of the terminal housing the sensor means.
30
- 35 16. A short-range wireless mobile communication system according to any of
claims 11 to 16,
characterized in
that the movement monitoring means (13) provides tracking data to a direction
calculation means (5, 10), whereby the tracking data are based on a movement
monitored for a terminal which houses the respective sensor means (11-1, 11-2,
12-1, 12-2).
17. A short-range wireless mobile communication system according to claim 16,

characterized in

that the direction calculation means (5, 10) estimates the position of the mobile terminal (2) relative to the first terminal (1) for the time of the next following exchange of information carrying signals.

5

18. A short-range wireless mobile communication system according to claim 16 or 17, characterized in

that the direction calculation means (5, 10) provides a control signal to the direction adjustment means (4) which is based on the tracking data and adapted to 10 adjust the controllable directional signal wave converter (1a) such that a reliable signal transmission is achieved.

19. A short-range wireless mobile communication system according to any of the preceding claims,

15 characterized in

that the mobile terminal (2) comprises an omnidirectional signal wave converter (2a) and the first terminal (1) comprises a controllable directional signal wave converter (1a).

20 20. A short-range wireless mobile communication system according to one of the claims 1 to 18,

characterized in

that the first terminal (1) comprises an omnidirectional signal wave converter (2a) and the mobile terminal (2) comprises a controllable directional signal wave 25 converter (1a).

21. A short-range wireless mobile communication system according to any of the preceding claims,

characterized in

30 that the controllable directional signal wave converter (1a) is formed by a mechanical steerable directional signal wave converter.

22. A short-range wireless mobile communication system according to one of the claims 1 to 20,

35 characterized in

that the controllable directional signal wave converter (1a) is formed by an adaptive signal wave converter array.

23. A short-range wireless mobile communication system according to any of the preceding claims,
characterized in
that the signal wave converter on first terminal (1) and the signal wave converter
5 on the mobile terminal (2) are each adapted for transmitting and receiving
information in form of a radio wave and/or light wave.

10 24. A short-range wireless mobile communication system according to claim 23,
characterized in
that an antenna forms a signal wave converter (1a, 2a).

15 25. A short-range wireless mobile communication system according to claim 23 or 24,
characterized in
that a signal wave converter (1a, 2a) comprises an electro-optical device.

20 26. A short-range wireless mobile communication system according to any of the
preceding claims,
characterized in
that the first terminal (1) is a stationary terminal.

25 27. A terminal for a short-range wireless mobile communication system,
comprising a directional signal wave converter (1a) for transmitting and/or
receiving an information carrying signal wave with a directional
characteristic (1b_I, 1b_{II}) and a control means (4, 5, 13, 20) that is adapted for
controlling the directional characteristic (1b_I, 1b_{II}, #0, #0') according to a position
of the terminal (1, 2) relative to a further terminal (2, 1) of the short-range wireless
mobile communication system.

30 28. A terminal according to claim 27,
characterized by
a control means (4, 5, 13, 20) according to one of the claims 2 to 18, and/or a
signal wave converter /1a, 2a) according to one of the claims 21 to 25.

35 29. A wireless communication device (2) for communicating information with a
terminal (1) in a short range multipath wireless communication system, the
wireless communication device comprising a directional signal wave
converter (1a) for transmitting and/or receiving the information carrying signal
wave with a directional characteristic (1b_I, 1b_{II}, #0, #0'), and a control means (4, 5,

13, 20) for controlling the directional characteristic ($1b_I$, $1b_{II}$, #0, #0') according to a position (I, II) of the device (2) with respect to the terminal (1).